Before the
Federal Communications Commission
Washington, DC 20554

In the matter of	
Digital Broadcast Content Protection	MB Docket No. 02-230

REPLY COMMENTS OF THE ELECTRONIC FRONTIER FOUNDATION

The Electronic Frontier Foundation ("EFF") hereby submits these reply comments in connection with the Commission's *Report and Order and Further Notice of Proposed Rulemaking,* FCC No. 03-273 (Nov. 4, 2003) ("*FNPRM*") in the above-captioned proceeding.

I. SOFTWARE-BASED DEMODULATORS SHOULD BE EXCLUDED FROM THE SCOPE OF THE COMMISSION'S BROADCAST FLAG MANDATE

In the *FNPRM,* the Commission sought "further comment on the interplay between a flag redistribution control system and the development of open source software applications, including software demodulators, for digital broadcast television."[1]

EFF has maintained from the outset in these proceedings that pure software-based demodulators should be excluded from the scope of any broadcast flag mandate, both to encourage innovation in software-defined radio (SDR) technologies and to avoid constitutional difficulties.[2]

A. The Commission Should Clarify Whether the Regulations Announced In the *FNPRM* Include Pure Software-Based Demodulators

As noted in EFF's earlier comments in response to the *FNPRM*, it appears that the "broadcast flag" regulations adopted by the Commission in the *FNPRM*

[1] *See FNPRM,* at ¶ 60.

[2] *See* Comments of the Electronic Frontier Foundation, FCC MB Docket No. 02-230 (filed Dec. 6, 2002); Reply Comments of the Electronic Frontier Foundation, FCC MB Docket No. 02-230 (filed Feb. 18, 2003); Comments of the Electronic Frontier Foundation, FCC MB Docket No. 02-230 (filed Feb. 13, 2004) ("EFF FNPRM Comments").

exclude pure software-defined demodulators from their scope, as they are restricted to demodulators fashioned from "components."[3]

The example of GNU Radio, a project that has already developed and published an open source software application that is capable of demodulating ATSC 8/VSB broadcast television signals using general purpose hardware, is instructive.[4] With respect to the software itself, GNU Radio is not a "component," and thus outside the definition of "Demodulator" under § 73.9000(g). The hardware necessary for GNU Radio—a general-purpose PC and high-speed analog-to-digital converter—also falls outside the definition of "Demodulator" because it is not designed to perform demodulation functions.

The MPAA Comments, however, assert that the current *FNPRM* regulations include pure software-based demodulators running on general purpose hardware.[5] EFF urges the Commission to clarify its view on this question to eliminate any doubt for software innovators.

B. The "Robustness" Requirements Contained in the Broadcast Flag Regulations Would Exclude and Open Source Software Developers from the DTV Marketplace

As described in the EFF FNPRM Comments,[6] the "robustness" requirements contained in the broadcast flag regulations would effectively eliminate open source developers from the digital broadcast television marketplace, artificially constraining competition and innovation. Although one can imagine open source software developers creating a "compliant" demodulator or downstream application, requiring that such a demodulator or application be "robust" against user modification is the problem.

The open source development model is premised on a simple notion: open source software is meant to be understood, modified, and improved by its users. This has been its chief advantage over closed source software and has resulted in an open, competitive, innovative environment for software development. To the extent the open source development model embraces the freedom to modify,

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[3] *See FNPRM* at 36, Appendix B, CFR § 73.9000(g) (defining "Demodulator" as "a component, or set of components, that is designed to perform the function" of demodulation). The original language proposed by the Motion Picture Association of America and its joint commenters expressly included "software." The Commission's definition chose not to adopt this language.

[4] For more on GNU Radio, *see* EFF FNPRM Comments, *supra*, at 2-4.

[5] *See* Comments of the Motion Picture Association of America, Inc., Metro-Goldwyn Mayer Studios, Inc., Paramount Pictures Corp., Sony Pictures Entertainment Inc., Twentieth Century Fox Film Corp., Universal City Studios LLP, and the Walt Disney Company, FCC MB Docket No. 02-230 (filed Feb. 13, 2004) (hereafter "MPAA Comments") at 14.

[6] *See* EFF FNPRM Comments, *supra*, at 3-4.

however, this necessarily means that open source software cannot be made "tamper-resistant" in the fashion contemplated by the broadcast flag mandate.

The MPAA Comments respond by pointing out that many open source software applications offer security features, citing firewall software as an example.[7] This discussion betrays a fundamental confusion regarding the difference between security—securing a PC *for* its owner—and "tamper-resistance"—securing a PC *against* its owner. Open source software has been very successful at the former goal (in fact, products based on open source software have proven to be more secure than closed source software). The latter goal—enforcing restrictions *against* the wishes of a computer's owner—is much harder in an open source environment, where the owner can modify the software.[8] The conflict is made evident by the broadcast flag mandate's express requirement that developers of Covered Products design their technologies to actively prevent end-user modification.[9]

The extent to which the broadcast flag mandate would slam the door on open source is made clear in the MPAA Comments, which admit of only 3 options available to open source developers under the broadcast flag regulations:

- choose not to distribute the software in interstate commerce (presumably permitting a single developer to work in a single garage, where she would be free to share her software with those within walking distance);
- incorporate the software into a compliant Demodulation Product or distribute only small portions of the software (which is to say, give up on open source development for anything other than a small portion of a demodulator or downstream application);
- distribute solely to a Bona Fide Reseller (so the person working alone in the garage apparently also has the freedom to collaborate with a tiny universe of non-open source vendors).[10]

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[7] *See* MPAA Comments, *supra*, at 15.

[8] One might imagine an open source implementation that would be "tamper-resistant" if the technical protection measure employed relied on secrets of some sort when actually distributed to a user, such as an encryption key. Where unencrypted over-the-air broadcasts are concerned, there is no "secret" that a receiver needs in order to demodulate the signal. All the demodulation techniques are publicly documented, so there is no authentication technique to conceal from end users.

[9] *See* FNPRM at § 73.9007.

[10] *See* MPAA Comments, *supra*, at 14.

The MPAA Comments also point out that numerous other FCC requirements apply to a variety of other receiving devices.[11] The critical difference between these regulatory requirements and the broadcast flag mandate is the requirement of "robustness." For example, GNU Radio can certainly add support for a closed-captioning decoder; what it cannot do (and is not required by any regulation to do) is implement this in a manner that cannot be modified by users.

C. If Applied to Open Source Software, the Broadcast Flag Mandate Would Constitute an Unconstitutional Restraint on Publication

Contrary to the misleading discussion contained in the MPAA Comments,[12] the broadcast flag regulations would directly impair the publication of open source software in a manner that would trammel the First Amendment rights of software developers.

This is made evident by considering the impact of that the broadcast flag regulations would have on GNU Radio. The entirety of the source code is available for download to the public.

Even if the developers of GNU Radio took steps to satisfy the compliance requirements of the broadcast flag regulation, they could not meet the "robustness" requirements while continuing to publish the entirety of their source code, as users would be able to modify the source code so as to be "noncompliant."

Thus, if the broadcast flag regulations were extended to cover software-based demodulators, continued publication of the GNU Radio source code in these circumstances would appear to be unlawful. Such an outcome presents serious constitutional difficulties.

The MPAA Comments give short shrift to the constitutional concerns of software developers. But the very case cited by the MPAA, *Universal City Studios v. Corley,* makes it clear that software is entitled to First Amendment protection and regulations that interfere with expressive publication must survive heightened constitutional scrutiny.[13] Several other courts have reached the same conclusion: any regulation that impedes the publication of software undertaken for expressive purposes must survive *at least* intermediate scrutiny upon judicial

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[11] *See id.* at 15.

[12] *See* MPAA Comments, *supra*, at 17.

[13] *See Universal City Studios v. Corley,* 273 F.3d 429, 446-49 (2d Cir. 2001).

review.[14] For the reasons discussed in detail in the EFF FNPRM Comments, the broadcast flag mandate would not survive such scrutiny.[15]

II. THE COMMISSION SHOULD RETAIN ITS RULE PROHIBITING ENCRYPTION OF RE-TRANSMITTED BROADCAST TELEVISION ON CABLE

EFF, CEA, HRRC, Matsushita and DTLA all agree that the Commission should leave in place its long-standing rule, set out at 47 CFR § 76.630(a), prohibiting the encryption of broadcast TV signals when re-transmitted over cable systems.[16] EFF has already described in its initial FNPRM Comments the ways in which this rule will (1) protect owners of legacy QAM-capable equipment; and (2) ensure "capability parity" for consumers whether they receive their DTV broadcast programming over an antenna or from a cable jack.[17]

In its comments on this subject, Time Warner urges the Commission to reverse course with respect to scrambling of the basic tier.[18] Unfortunately, Time Warner's arguments appear founded on several fundamental misunderstandings.

First, Time Warner asserts that consumers today "do not have an expectation—or the capability—of receiving digital cable services in the clear without a set-top box."[19] This is simply incorrect. As pointed out in EFF's FNPRM Comments, QAM-capable DTV devices have been in the marketplace for some time, and their number is sure to grow substantially in the interim period before POD-enabled devices become commonplace.[20] Furthermore, many

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[14] *See, e.g., Bernstein v. U.S. Dept. of Justice,* 176 F.3d 1132, 1141 (9th Cir.), *reh'g in banc granted and opinion withdrawn,* 192 F.3d 1308 (9th Cir. 1999); *U.S. v. Elcom Ltd.,* 203 F.Supp.2d 1111, 1126-27 (N.D. Cal. 2002); *Bernstein v. U.S. Dept. of State,* 922 F. Supp. 1426, 1434-36 (N.D. Cal. 1996).

[15] *See* EFF FNPRM Comments, *supra*, at 5-6.

[16] *See* EFF FNPRM Comments, *supra*, at 6-8; Comments of the Consumer Electronics Association, FCC MB Docket No. 02-230 (filed Feb. 13, 2004) at 2-4; Comments of the Home Recording Rights Coalition, FCC MB Docket No. 02-230 (filed Feb. 13, 2004) at 2-3; Comments of Matsushita Electric Corporation of America, FCC MB Docket No. 02-230 (filed Feb. 13, 2004) at 1-2; Comments of the Digital Transmission Licensing Administrator, FCC MB Docket No. 02-230 (filed Feb. 13, 2004) at 2-3.

[17] *See* EFF FNPRM Comments, *supra*, at 6-8.

[18] *See* Comments of Time Warner Inc., FCC MB Docket No. 02-230 (filed Feb. 13, 2004) at 16-17.

[19] *See id.* at 17.

[20] *See* EFF FNPRM Comments, *supra*, at 7. Examples of QAM-capable devices include televisions from Mitsubishi (model WS-55711), Toshiba (models 57HX93 and 65HX83), and Sony (models KDL-32XBR950 and KDL-42XBR950), and PVRs from Zenith (model HD-PVR330).

consumers are, today, enjoying DTV broadcast content over cable without the need for a set-top box. To take just one example, it is our understanding that Cox Cable is currently re-transmitting digital broadcast programming in-the-clear as part of its basic tier digital service. Consumers with QAM-capable tuners are able to receive this signal without a set-top box (just as they are able to receive analog broadcast signals on the basic tier without a set-top box).

Time Warner also asserts that "[g]oing forward, all digital television sets designed to receive digital cable services…will have to incorporate—or connect to—some decryption capability in order to receive digital cable services."[21] This is also erroneous. So long as the Commission's existing rules mandating the unscrambled carriage of broadcast signals on the basic tier persist, QAM-capable devices will continue to be able to receive at least these broadcast signals on the digital basic tier, without the need for any decryption capability.

The MPAA, meanwhile, is alone among the commenting parties in taking the radical view that cable operators should be *required* to scramble DTV broadcast programming on the basic tier.[22] Their arguments in favor of this position are without merit.

First, the MPAA suggests that mandatory encryption would facilitate the introduction of new modulation schemes, such as 1024-QAM. The MPAA fails to conjure any evidence regarding the likelihood of this scenario or any special difficulty in simply adding this modulation to the QAM modulation schemes already covered by the broadcast flag regulation.

Second, the MPAA argues that mandatory encryption will help cable operators to protect copyrighted content on the basic tier. This argument is a bit puzzling, as broadcast programming carried on the basic tier is already protected—by the very broadcast flag regime successfully urged on the Commission by the MPAA! The MPAA is unable to muster any argument to suggest that what is good enough for broadcast is not good enough *for the very same programming* when retransmitted on the basic tier. After all, any consumer could use broadcast-flag compliant devices to obtain the same programming by hoisting an antenna. It is difficult to understand, however, why she should be put to the trouble when the very same signal is already part of her basic tier cable service.

Finally, the MPAA suggests that mandatory basic tier encryption will increase compatibility. This assertion cannot withstand scrutiny. As pointed out by HRRC, the Commission adopted its prohibition on scrambling of broadcast

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[21] *See* Time Warner Comments, *supra*, at 17.

[22] *See* MPAA Comments, *supra*, at 11-13.

content on the basic tier in order to encourage compatibility and competition.[23] After all, a cable subscriber is entitled to choose any broadcast-flag compliant device she likes to receive DTV broadcast programming. If the device she chooses includes a broadcast flag compliant QAM tuner, a scrambled signal will force her to choose between (1) rigging a separate antenna and purchasing a ATSC tuner or (2) buying a set-top box or CableCard device to descramble broadcast programming on the basic tier.[24] There is no reason to impede compatibility in this manner.

III. THE PROFESSIONAL AND COLLEGIATE SPORTS COMMENTS MISCONCEIVE THE RELATIONSHIP BETWEEN COPYRIGHT LAW AND THE BROADCAST FLAG MANDATE

In their comments in response to the *FNPRM*, a coalition of professional and collegiate sports organizations (hereinafter "Sports Organizations") appear to be concerned that the Commission's broadcast flag mandate may force sports organizations "to waive their rights under copyright law as a condition of making their copyrighted programming available over digital broadcast television."[25] This rather outlandish concern appears to be grounded in a fundamental misunderstanding of copyright law, and its interaction with the Commission's broadcast flag regulations.

First, the Sports Organizations appear to misunderstand the relevant copyright law principles at issue in this docket. In promulgating its broadcast flag mandate, the Commission is not directly regulating the conduct of individual American television viewers. Rather, it is regulating the manufacturers of DTV devices. Accordingly, the relevant copyright law principles here are the principles of *secondary liability*. These principles make it clear that a copyright owner's statutory monopoly will not reach a device so long as that device is "merely …capable of substantial noninfringing uses."[26]

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[23] *See* HRRC Comments, *supra*, at 2-3.

[24] Of course, if she wants premium cable services, she will have to obtain a device that includes decryption capabilities. But just as millions today rely on their TiVo PVRs to record OTA broadcast programming direct from their unscrambled basic tier cable jack, many cable subscribers in the DTV future may want to rely on non-POD-capable devices to record OTA broadcast programming straight from the cable jack. *See* EFF FNPRM Comments, *supra*, at 7-8.

[25] *See* Comments of Office of the Commissioner of Baseball, National Basketball Association, National Hockey League, National Football League, Women's National Basketball Association, National Collegiate Athletic Association, PGA Tour Inc., and Ladies Professional Golf Association, FCC MB Docket No. 02-230 (filed Feb. 13, 2004) at 3.

[26] *See Sony v. Universal City Studios,* 464 U.S. 417, 442 (1984).

EFF agrees with the Sports Organizations that "whatever steps the Commission takes, it must operate within the boundaries of copyright law."[27] However, in light of the secondary liability principles set forth in copyright law, it is plain that, so long as its regulations do not endorse purpose-built piracy devices, nothing about the broadcast flag mandate trammels the rights of copyright owners. They remain free to enforce their copyright rights against device manufacturers and individual television viewers under existing copyright law principles.

Of course, the Commission must also be cognizant of the copyright interests of consumers. Here, the Sports Organizations badly misstate the relevant law regarding fair use by suggesting that time-shifting for personal use fully exhausts the scope of fair uses of broadcast television programming. While the Supreme Court in *Sony v. Universal City Studios* approved this type of use as fair, there is nothing in that opinion or any other that establishes this as the *ceiling* for fair use. A fair use determination requires a case-by-case, judicial evaluation. Accordingly, until a particular use is tested in court, it can be difficult to ascertain whether it properly falls within the scope of fair use. More importantly, the reach of fair use can change in light of new technologies and marketplace realities.[28]

All of this makes one thing clear—it is not for the Commission to decide in this docket what consumer activities relating to broadcast television programming should be deemed fair uses. Accordingly, in fashioning its broadcast flag mandate, the Commission must be cautious to leave room for disputed consumer uses, lest it prematurely foreclose a future judicial determination. The EFF joins HRRC and Philips[29] in urging the Commission to give a wide berth to legitimate consumer expectations and potential fair uses.

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[27] *See* Sports Organization Comments, *supra*, at 4.

[28] Indeed, it was not until the Betamax VCR had entered the marketplace that a court was called on to determine whether time-shifting constituted a fair use. Most copyright experts of the day believed that such activity could not qualify as a fair use because it appropriated the entirety of the copyrighted work in a nontransformative manner. The Supreme Court nevertheless upset these expectations by extending the fair use doctrine to include noncommercial "consumptive" time-shifting.

[29] *See* HRRC Comments, *supra*, at 6-7; Comments of Philips Electronics North America Corp., FCC MB Docket No. 02-230 (filed Feb. 13, 2004) at 29-30.

IV. TECHNOLOGY STANDARDS FOR THE BROADCAST FLAG AND PLUG AND PLAY PROCEEDINGS SHOULD NOT BE UNIFIED

The Commission has also requested comment regarding the relationship between the standards and procedures adopted for approval of broadcast flag technologies and those governing the "plug & play" proceeding.[30]

EFF joins Philips, CEA, the IT Coalition, Public Knowledge, Consumers Union, and NCTA in concluding that a unified regime is not warranted.[31] As described in detail in the comments of the NCTA, the security considerations relevant to devices seeking to comply with "plug & play" requirements are entirely different from those applicable to devices designed to receive broadcast television signals.[32]

The two proceedings are motivated by very different considerations. The "plug & play" docket has been aimed at maximizing the compatibility and competition in an environment where the marketplace has been reserved for decades solely to cable service providers. In this context, virtually any step to open up the market is a step in the right direction, even where it fails to guarantee complete compatibility, as the default position was no compatibility at all.

The broadcast television context could not be more different in this regard. Thanks to the publicly-documented ATSC standards for over-the-air digital broadcast television, the default position in the DTV marketplace is perfect compatibility and open competition. (This, incidentally, would also be the case for broadcast television retransmitted as part of the cable basic tier, so long as such retransmissions remain unscrambled.) In this context, it is critical that content protection technologies mandated by the broadcast flag do no more harm than absolutely necessary to the open competitive marketplace.

Accordingly, EFF must respectfully disagree with the comments of the American Antitrust Institute (AAI), which take the position that the same procedures should apply "irrespective of the mode of delivery of the digital content."[33] The AAI suggests that it would be "incongruous" if device capability

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[30] *See FNPRM* at ¶ 61.

[31] *See* Comments of Philips, *supra,* at 33; Comments of CEA, *supra*, at 5; Comments of the IT Coalition, FCC MB Docket No. 02-230 (filed Feb. 13, 2004) at 14-16; Comments of Public Knowledge and Consumers Union, FCC MB Docket No. 02-230 (filed Feb. 13, 2004) at 17; Comments of the National Cable & Telecommunications Ass'n, FCC MB Docket No. 02-230 (filed Feb. 13, 2004) at 2 ("NCTA Comments").

[32] *See* NCTA Comments, *supra*, at 2.

[33] *See* Comments of the American Antitrust Institute, FCC MB Docket No. 02-230 (filed Feb. 13, 2004) at 7-8.

depended on the mode of delivery. To the contrary, it would be incongruous if a "capability gap" failed to develop.

Although the "plug & play" regulations go a long way to ensuring compatibility and competition in the MVPD context, they certainly have not entirely closed the gap with the open, standards-based world of broadcast television. As discussed extensively in the NCTA comments, cable systems operators still have security concerns and systems requirements that require that "plug & play" devices be closely scrutinized before they are allowed into the marketplace. These requirements exist over and above the limited content-protection requirements endorsed by the Commission's broadcast flag mandate—namely, the narrow aim of preventing indiscriminate Internet redistribution.

In light of this distinction, there is every reason to expect that "plug & play" devices will be *less capable* than broadcast flag devices in some circumstances. There is certainly no reason why the Commission should forcibly close this "capability gap" by forcing broadcast flag devices to comply with the more stringent requirements applicable to "plug & play" devices.[34] If anything, the pressure should apply in the opposite direction—to constantly revisit the "plug & play" docket to determine whether more compatibility and competition can be squeezed out of MVPD providers.

/s/

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[34] In fact, if broadcast flag-compliant devices offer more features to consumers than similar "plug & play" devices, this might exert a healthy competitive pressure on MVPDs to permit more competition and compatibility within their systems, as well.